

What is Claimed is:

1. A process for the monoalkylation of C-H acidic methylene groups comprising reacting a methylene group-bearing substrate with a dihalogen alkane, wherein:
 - a) the two halogen atoms in said dihalogen alkane are separated by a chain of at least 3 carbon atoms;
 - b) the reaction is carried out in the presence of:
 - i) one or more alkali carbonates or alkaline earth carbonates; and
 - ii) a phase transfer catalyst;
 - c) there is the constant removal of water formed during the reaction from the reaction mixture; and
 - d) said one or more alkali carbonates or alkaline earth carbonates are, when added together, present in a molar ratio relative to the methylene group-bearing substrate of greater than 0.6:1.
2. The process of claim 1, wherein the reaction between said methylene group-bearing substrate and said dihalogen alkane takes place in a polar aprotic solvent and wherein said one or more alkali carbonates or alkaline earth carbonates are present in a molar ratio relative to said methylene group-bearing substrate of greater than 1:1.
3. The process of either claim 1 or claim 2, wherein, from the beginning of the alkylation reaction, said phase transfer catalyst is continuously metered into the reaction mixture.
4. The process of either claim 1 or claim 2, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.
5. The process of any one of either claim 1 or claim 2 wherein potassium carbonate is the sole alkali carbonate or alkaline earth carbonate used.
6. The process of claim 4, wherein potassium carbonate is the sole alkali carbonate or alkaline earth carbonate used.

7. The process of either claim 1 or claim 2, wherein a cyclic hydrocarbon or an aromatic hydrocarbon is used as an entrainer to remove reaction water.
8. The process of claim 7, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.
9. The process of either claim 1 or claim 2, wherein a quaternary ammonium salt is used as said phase transfer catalyst.
10. The process of claim 9, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.
11. The process of claim 9, wherein potassium carbonate is the sole alkali carbonate or alkaline earth carbonate used.
12. The process of either claim 1 or claim 2 wherein said methylene group-bearing substrate, said dihalogen alkane and the aggregate of said one or more alkali carbonates or alkaline earth carbonates are present in a ratio of 1:2.0-5.0:1.0-2.0.
13. The process of claim 12, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.
14. The process of claim 12, wherein a cyclic hydrocarbon or an aromatic hydrocarbon is used as an entrainer to remove reaction water.
15. The process of claim 12, wherein a quaternary ammonium salt is used as said phase transfer catalyst.
16. The process of either claim 1 or claim 2, wherein said polar aprotic solvent is selected from the group consisting of: DMF, DMSO, dimethylacetamide and N-methylpyrrolidone.

17. The process of claim 16, wherein said methylene group-bearing substrate, said dihalogen alkane and the aggregate of said one or more alkali carbonates or alkaline earth carbonates are present in a ratio of 1:2.0-5.0:1.0-2.0.
18. The process of claim 16, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.
19. The process of claim 16, wherein a cyclic hydrocarbon or an aromatic hydrocarbon is used as an entrainer to remove reaction water.
20. The process of claim 16, wherein a quaternary ammonium salt is used as said phase transfer catalyst.
21. A process for the monoalkylation of C-H acidic methylene groups, comprising reacting a methylene group-bearing substrate with a dihalogen alkane in a solvent selected from the group consisting of: DMF, DMSO, dimethylacetamide and N-methylpyrrolidone, wherein:
 - a) the two halogen atoms in said dihalogen alkane are separated by a chain of at least 3 carbon atoms;
 - b) the reaction is carried out in the presence of:
 - i) one or more alkali carbonates or alkaline earth carbonates; and
 - ii) a quaternary ammonium salt;
 - c) there is the constant removal of water formed during the reaction; and
 - d) said one or more alkali carbonates or alkaline earth carbonates are, when added together, present in a molar ratio to the methylene group-bearing substrate of greater than 0.6:1.
22. The process of claim 21 wherein said methylene group-bearing substrate, said dihalogen alkane and the aggregate of said one or more alkali carbonates or alkaline earth carbonates are present in a ratio of 1:2.0-5.0:1.0-2.0.
23. The process of claim 22, wherein said methylene group-bearing substrate is a 1,3-dicarbonyl compound.

24. The process of claim 23, wherein potassium carbonate is the sole alkali carbonate or alkaline earth carbonate used.
25. A process for producing a ω -alkyl halide nitrile or ω -halogen carboxylic acid, comprising:
 - a) reacting a malonic acid diester or cyanoacetic acid ester with a α,ω -dihalogen alkane, wherein:
 - i) the two halogen atoms in said α,ω -dihalogen alkane are separated by a chain of at least 3 carbon atoms;
 - ii) the reaction is carried out in the presence of one or more alkali carbonates or alkaline earth carbonates and a phase transfer catalyst with the constant removal of water formed during the reaction; and
 - iii) said one or more alkali carbonates or alkaline earth carbonates are, when added together, present in a molar ratio to the malonic acid diesters or cyanoacetic acid esters of greater than 0.6:1; and
 - b) saponifying and decarboxylating reaction products produced in step a).
26. The process of claim 25, wherein the saponification and decarboxylation are performed by adding a catalyst acid without the addition of a solvent.
27. The process of claim 25, wherein the reaction between said malonic acid diester or cyanoacetic acid ester and said α,ω -dihalogen alkane takes place in a polar aprotic solvent and wherein said one or more alkali carbonates or alkaline earth carbonates are present in a molar ratio to the malonic acid diesters or cyanoacetic acid esters of greater than 1:1.
28. The process of claim 27, wherein said polar aprotic solvent is selected from the group consisting of: DMF, DMSO, dimethylacetamide or N-methylpyrrolidone.

29. The process of any one of claims 25-28, wherein said the malonic acid diesters or cyanoacetic acid esters, said α,ω -dihalogen alkane, and said one or more alkali carbonates or alkaline earth carbonates are added in a ratio of 1:2.0-5.0:1.0-2.0.
30. The process of any one of claims 25-28, wherein a cyclic hydrocarbon or an aromatic hydrocarbon is used as an entrainer to remove reaction water.
31. The process of any one of claims 25-28, wherein a quaternary ammonium salt is used as said phase transfer catalyst.